

Libby, Montana
September 25, 1929

S
Insect Control-Kootenai

Reports

INSECT CONTROL MEMORANDUM

An intensive insect survey was made of the Kootenai Forest during July and part of September, 1929, by the writer, to determine the extent of the damage being done by the mountain pine beetle in our white pine and lodge pole forests.

A survey was made in July, 1929, in the lodge pole type on the west fork of the Yaak river and on Garver creek, where an epidemic of the mountain pine beetle exists. I put in several days in this infested area, making a study of the habits, direction of spread in flight, and effect of parasites, etc. The 1928 attacks had not yet emerged in this area.

An estimate of fading and red tops in the lodge pole on the west fork of Yaak and on Garver creek indicates approximately a 40 per cent increase in 1928 over the 1927 bark beetle attacks.

On examination many egg gallerys and larvae mines were found with no broods, this is probably due to the heavy attack of 1928 killing the trees more quickly, causing the cambium to become too dry for the eggs to hatch. Therefore a smaller percent of increase of attacks can be expected in the lodge pole pine for 1929.

There are two lookout points overlooking several thousand acres of the lodge pole type in which this epidemic exists, which make good points for observing the direction and extent of spread from year to year. This observation is based on the fading, red and black tops.

This infestation came over from the Canadian side, caused by fires in their lodge pole timber and by the C.P.R. logging operations adjacent to the United States border, where no disposal of slash was made, leaving the tops in the woods and making an abundance of ideal food for the beetles. Thus large broods were developed. When this food supply was exhausted, the beetles attacked the live standing trees on the United States side, in a large area of mature lodge pole pine and extended south into a good stand of white pine on Pete Creek. Then in the winters of 1924 and 1925 a partial winter kill occurred, leaving the timber in a weakened condition favorable for beetle development, the broods increasing several hundred percent in the years 1925-26-27.

Direction of spread of beetles:

It is generally believed that the winds play an important part in the direction and spread of the beetles, and in some cases they probably do. However, in my observations in the upper Yaak and several other drainages, where the mountain pine beetle work could be traced back for forty or more years by wind falls and snags where epidemics had existed (as is to be found in a study of the south fork of Keeler

*(Cross-reference in
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creek) the direction of spread always followed the direction of the main food supply, whether it was north, south, east or west, regardless of prevailing wind direction. In no instance on the Kootenai has an infestation in the epidemic stage crossed an area of more than one-fourth mile distance, where there was no food or pine species in its path. There are indications of some of our normal infestations being due to a few beetles making the flight across a pineless area for short distances.

On examinations of old infestations when they were in epidemic stages they all appeared to have died out before the food supply was exhausted. This appears to have been due to two causes. First the supply of mature and suppressed trees was exhausted, leaving thrifty timber, causing a higher flight and brood mortality, thus checking the spread. This pause in the spread then gave the parasites a chance to increase on the advanced edges of the infestation. These two causes could be stated as the physical and biological factors contributing.

All of the areas examined were found to be local infestations, as old beetle work could be traced for several years past; the increase within the last few years apparently being due to the 1924 and 1925 winter kill, or wind throw or ground fires, except in Pete Creek, where the advanced spread from the west fork of Yaak river and Garver creek within the last few years can be traced over the low divide in the lodge pole pine into Pete creek.

On examination of this area it was found that the parasites were quite numerous in the heavy infestations, or near the 1928 attacks, but on the outer edge of the 1929 attacks very few parasites were found.

On areas of this sort, where the timber is of no great value, a plan of control work could be used to advantage which would be much cheaper and also effective, namely; by treating only the trees on the outer edges of the infestations, where fewer parasites would be destroyed, and leaving the blocks where the parasites are doing good work. It would probably take a year or so longer to get the area back on a normal or biological balance, but the difference in cost would more than offset the value of timber destroyed in the few extra years it would take to obtain the desired results.

The cost of making a one-hundred percent artificial control on an area of this size would be prohibitive from the stand point of timber values saved and I believe the partial control would have practically the same effect at a much lower cost.

This method of control is recommended only in lodge pole pine where the infestation is in the epidemic stage, as in the Yaak drainage, where the lodge pole is mature, of an inferior quality, and has served its purpose as a ground cover. As is the case in most all of this type, there is a good stand of spruce and larch coming in where the lodge pole is being thinned by beetles and other causes.

Where the bark beetles are in our white pine stands a one-hundred percent control should be executed in order to save our most valuable species. Where the white pine is being killed an inferior species, usually consisting of white fir and hemlock, takes its place.

If funds were available for fall control work of the bark beetle, more effective work could be accomplished at a lower cost, as most of our white pine areas on the Kootenai are snow covered in the spring until the middle of May or the first of June, making transportation difficult and expensive.

Also an improvement crew on roads and trails could do much effective work in treating beetle attack trees encountered near their work, at a much cheaper cost than could be done with a treating crew.

Ed Herricks

Forest Ranger.

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PETE CREEK

#1 Project.

Insect control work was done in this area in the 1925-1926 and 1927 seasons, but none in 1928.

Each year approximately the same number of beetle attack trees were treated; this was due to the beetle epidemic in the West Fork of the Yaak river, and the Garver creek infestation spreading in the lodge pole on the West Fork, Pete Creek divide, and a few infested trees being left untreated in Pete Creek as very few of the trees in the Pete Creek drainage began to fade until the second year of the attack, making it difficult to get a 100% control of the bark beetle attacked trees.

In making the insect survey in July of 1929, no 1929 attacks were found, as the 1928 broods were still in the larvae and adult stages, therefore a red top survey was made, and an estimate of the extent of spread from the 1927 attacks.

After making the red top survey, strips were run through part of the white pine where clumps of red tops were located, and it was found that only about sixty percent of the red tops could be counted from the distance when the observation was made.

The following is the result of the red-top survey:
294 trees plus 40% - 439 white pine 1928 attacks.
246 Lodge Pole 40% - 344 Lodge pole 1928 attacks.
Making a total of 833- 1928 attacked trees.

Allowing a 40% increase for the 1929 attack, which I believe is a safe estimate, would make 1166 trees to be treated in 1930 at a cost of \$3.50, equalling \$4071.00, or rounded off at \$4000.00 for the Pete Creek Job.

A few parasites were found in the white pine, but not enough to bring this area back to a normal infestation for

Ed Hennrichs

several years, and as this is a gradual advance spread of the West Fork infestation I believe Pete Creek is the logical place to check the West Fork-Garver Creek epidemic . If climatic conditions remain normal for the next two years, with sufficient funds for one hundred percent control work in Pete Creek each year, I believe we can check the advanced spread from the main infestation and create a balanced condition. This will put the area back to a normal infestation, as the examination shows the parasites are about one year behind the spread of the bark beetles.

The white pine is thrifty 160 to 170 year old stand, and the last few years bug kill consisted mostly of suppressed and defective trees leaving the more thrifty with higher resistance. The above method of control is recommended for Pete Creek.

Two camps will be required for treating in order to save walking time. This could be arranged with one camp outfit working the lower drainage first and moving the camp to a new site later on.

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MEADOW CREEK- SOUTH & NORTH FORKS #2 Project.

Survey and examination of Meadow creek was made on August 2 and 3, 1929.

Meadow creek is a tributary of the Yaak river and this section is one of the best white pine blocks of timber in the Yaak drainage, fifty per cent being mature.

An estimate of the white pine in this block is 26,000 M.

Some of the 1928 attacks had not emerged when examination was made. 517 chains of strips of one chain width were run, making a total of 51 acres, with 31 1929 attacks found. The area consists of approximately 1920 acres, making a total of 1152 1929 attacks to be treated in 1930. Treating cost being estimated at \$4.50 per tree, a set up of \$5000.00 should handle this project.

The estimate of the 1929 attack is probably high, as strips were run through two clumps of 1928 attacks. Very few parasites were found in the area; attacks are heavy along the creek in the mature timber.

Control work is recommended for this area in 1930. Two camps will be required, one on each fork of Meadow creek.

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STAR CREEK

#3 Project.

An insect survey and examination of Star Creek was made on July 18 and 19, 1929.

There is an old infestation in this drainage, dating back 30 to 40 years, which appears to have been at normal for a few years before the 1924 and 1925 winter kill, then a slight increase in the bug killed trees appears for 1926, 1927 and 1928. There is about a ten percent increase in 1928 over the 1927 attacks.

This is one of our best white pine blocks on the Kootenai, with an estimate of 19,000 M. merchantable white pine timber.

The 1928 attacks had not emerged at the time of this examination and the probable increase for 1929 attacks was estimated by comparing the increase of 1928 over the 1927 attacks, and the number of parasites compared to the number of bark beetle larvae per square foot of bark surface.

The area is slightly above a normal infestation of bark beetles; parasites appear to be quite numerous and on the increase.

The estimate of the 1928 attack, by one-chain strips for the area, is 110 trees; with a ten per cent increase for 1929, an estimate of 160 trees could be placed, to be treated in 1930.

The cost will be higher than the average on account of the large area and the fact that the infested trees are scattered over the entire area. An estimate of \$6.00 per tree, or \$1000.00 for the project, is made.

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UPPER QUARTZ AND SEVENTEEN MILE
#4 Project.

There is a heavy infestation of mountain pine beetle in the upper Seventeen Mile creek section. The white pine consists of a mixture of mature and young timber.

A red top survey shows approximately fifty per cent of the white pine has been bug killed since the 1925 fire.

There is a low divide between Quartz and Seventeen Mile creeks, although it appears the beetles are not crossing, as there is a small block of white pine on the divide free from beetle attacks.

Main Quartz Creek consists of large, mature white pine. There is an old beetle infestation in this drainage, dating back several years, and this appears to have been increasing slightly for the last few years, probably due to the timber being mature, and offering little resistance.

Treating cost per tree would be high in Quartz creek, due to the size of the timber, as the white pine will average 28 to 30 inches D.B.H.

The estimate of the 1929 attacks on Quartz creek is 400 trees at a cost of \$5.00 per tree, making a total of \$2000.00.

Seventeen Mile creek 1929 attack is estimated at 850 trees, at a cost of \$4.00 per tree, or a total of ~~\$3400.00~~ 3400

These two areas should be considered as one project, and require a set up of \$5400.00. These areas should also be included in our 1930 control plans.

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BEAR CREEK

Control work was done on this area in the spring of 1929, with very good results.

In making the survey in September, 1929, an intensive examination was made, 341 chains of strips of one chain width were run, only one 1929 attack found, making an estimate of thirty 1929 attacks for the area.

This area should be followed up with control work this fall or next spring, preferably this fall.

As the entire area will have to be covered by a spotting crew, this will make a high control cost per tree, as \$300.00 will be needed as a set-up for this area.

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WEST FORK QUARTZ CREEK.

A one hundred percent insect control work was made in the spring of 1929 in this drainage, showing very good results, as only three 1929 attacks were found on the area. This makes an estimate of 56 trees for the 1929 attack of the area.

This will have to be covered by a spotting crew which will make a high control cost per tree treated. There should be a follow-up of this spring's work which should be done this fall or next spring, preferably this fall.

\$400.00 will be needed for this project in order to make a one-hundred percent clean up.

Ed Herricks

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RABBIT CREEK

There is a small block of white pine in the upper part of the drainage, consisting of approximately 600 M. of thrifty timber. In 1928 pine beetle- infested trees were treated, but no control work done in 1929.

A 100% survey was made in August of 1929 and nine 1928 attacks were found, no 1929 attacks being found, as the 1928 brood had not yet emerged.

A number of parasites were found in the infested trees.

A safe estimate of the 1929 attacks would be 25 trees, at a cost of \$4.00 per tree, as the timber is reasonably small and the area is accessible to auto transportation.

It is recommended that this area be included in the 1929 fall control plan.

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FOWLER CREEK

Fowler Creek is a tributary of the South Fork of the Yaak river.

There is a heavy infestation of bark beetles on lower Fowler creek, which appears to be increasing during the last few years, due to ground fires probably in 1925-26.

This area is a lodge pole type, with a fairly good road, for fall hauling, within one-fourth mile of the infestation. Burning method of control, and fall work recommended.

The survey made gives an estimate of 650 trees of 1929 attacks, at \$1.50 per tree, making a total of \$975.00 needed for this project.

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ZIMMERMAN HILL

The Zimmerman Hill infestation lies two miles north of Upper Ford Ranger Station on the east side of the Yaak-Rexford road, easilly accessible by auto truck.

Area consists of 1000 acres of mature lodge pole type with a fair stand of spruce and larch replacing the lodge pole as it is being killed by bark beetles.

This is a fall chance as the burning method of control could be used to advantage and with fall burning the fire danger is not so great.

This infestation is a beginning of an epidemic and is still practically all in the west slope of Zimmerman Hill. There is a large area of lodge pole pine to the east extending ten miles wide, with a few mountain pine beetles scattered through, but still below a normal infestation.

Under normal climatic conditions it is believed the Zimmerman Hill infestation could be brought back to normal, or below normal, within two years.

If no control work is done there is a good chance of the beetles spreading to the east and destroying thousands of acres of our lodge pole timber.

The strip estimates 2056 1928 attacks, as there are a number of parasites in the main infestation. A thirty per cent increase for 1929 would be a fair estimate, making approximately 3000 1929 attacks.

With fall work ensuing, the burning method being used, the cost would be about \$1.50 per tree, making a total of \$4500.00

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FOURTH OF JULY CREEK

The estimate on Fourth of July creek was made by the timber cruising crew, recording the 1928 attack found in each plot.

The beetles are only in a small area of the white pine in Sections 19 and 20, but there appears to be a slightly above normal infestation.

The estimate gives 400, 1928 attack; allowing for a normal increase the 1929 attacks could be safely placed at 600.

This area should be treated for \$3.50 per tree, making a total of \$2100.00 for the job.

It is recommended that this area be included in our 1930 control work.

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NORMAL INFESTATION

There are a number of normal infestations that could be handled by the district rangers with improvement crews during the summers work at a much lower cost.

However, these drainages should be examined each year to determine the amount of increase or decrease in beetle work, and percentage of parasites compared to the beetles per square foot of bark surface.

The following is a list of the normal infestations in the order of their importance:

- | | |
|------------------------------|----------------------|
| 1. Lower Pipe Creek. | 9. Callahan Creek |
| 2. Benning Creek. | 10. Burnt Creek |
| 3. North Fork Keeler Creek | 11. Crawford Creek |
| 4. Main Keeler Creek. | 12. Bobtail Creek |
| 5. Ruby Creek | 13. Spread Creek |
| 6. Coal Creek | 14. Upper Pine Creek |
| 7. South Fork Yaak River. | 15. Smearl Creek |
| 8. Halverson Creek | 16. Lynx Creek. |
| 17. North Fork Keeler Creek. | |

These drainages are practically all below a normal infestation.

An appropriation of \$2000.00 set aside for ranger's use and to take care of a few small jobs would do a great deal towards preventing an epidemic of the bark beetle.

Ed Herrick

1924
true

Following is the amount of fund needed for each drainage:

cont of \$5

for true (unreduced job)

1166	Pete Creek	\$4000.00	
1152	Meadow Creek ✓	5200.00	5750
160	Star Creek ✓	1000.00	1000
1250	Upper Quartz Creek ✓	5000.00	6250
30	Bear Creek ✓	300.00	300
56	W.F. Quartz Creek ✓	400.00	400
25	Rabbit Creek ✓	100.00	100
650	Fowler Creek ✓	975.00	
300	Zimmerman Hill ✓	4500.00	
600	Fourth of July Creek ✓	2100.00	3000
	Normal Infestations ✓	2000.00	2000
	TOTAL	25975.00	18800

$$9475 + 2570 = 2000$$

8089

4816

3273

5

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